

CLAIMS

What is claimed is:

1 1. A network receiver configured for receiving a modulated carrier signal from
2 another network transceiver via a network medium, the network receiver comprising:

3 a) an input amplifier for amplifying a received modulated carrier signal
4 according to one of a plurality of amplifier gain settings and outputting an amplified
5 carrier signal;

6 b) an envelope detector configured for outputting an envelope signal in
7 response to the amplified carrier signal;

8 c) a first gain control circuit configured to select a first gain setting in
9 response to the envelope signal, the first gain setting being optimal for receiving a
10 pulse position modulated carrier signal;

11 d) a second gain control circuit configured to select a second gain control
12 setting in response to the envelope signal, the second gain setting being optimal for
13 receiving a quadrature amplitude modulated signal; and

14 e) selection circuitry configured to determine whether the envelope signal
15 represents a pulse position modulated carrier or an amplitude modulated carrier and
16 sets the amplifier gain setting to the first gain setting or a second gain setting
17 respectively.
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1 2. The network receiver of claim 1, further including an analog to digital converter
2 generating a digital carrier signal in response to the amplified carrier signal, the
3 envelope detector responsive to the digital carrier signal.
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1 3. The network receiver of claim 2, further including a Hilbert transformer
2 generating a digital I channel carrier signal and a digital Q channel carrier signal in
3 response to the amplified carrier signal, the envelope detector responsive to the
4 digital I channel carrier signal and the digital Q channel carrier signal.
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1 4. The network receiver of claim 3, wherein the selection circuitry includes a
2 carrier sense circuit for detecting the duration of a power pulse in the envelope
3 signal.

1 5. The network receiver of claim 4, wherein the selection circuitry selects the first
2 gain setting if the duration of a power pulse is less than a duration on the order of a
3 duration of a pulse position modulation power pulse.

1 6. The network receiver of claim 5, wherein the selection circuitry selects the
2 second gain setting if the duration of a power pulse is greater than a duration on the
3 order of a duration of a pulse position modulation power pulse.

1 7. The network receiver of claim 6, wherein the envelope signal represents the
2 square root of the sum of the square of the I channel carrier signal and the square of
3 the Q channel carrier signal.

1 8. The network receiver of claim 7, wherein the first gain control circuit includes a
2 plurality of comparators, each configured to compare the envelope signal with one of
3 a plurality of reference signals and the first gain setting is determined by detecting
4 saturation of at least one comparator when iteratively testing each of the plurality of
5 gain settings.

1 9. The network receiver of claim 8, wherein the second gain control circuit
2 includes a logarithmic look up table generating a log signal representing the envelope
3 signal, a comparator comparing the log signal to a reference signal to generate a
4 difference signal, a multiplier multiplying the difference signal by a loop gain constant
5 to generate a product, and an integrator integrating the product to generate the
6 second gain setting.

1 10. The network receiver of claim 9, wherein the loop gain constant is selected to
2 be a large value for a first portion of a detected power pulse, a smaller value for a
3 second portion of a detected power pulse, and zero for a remaining duration of a
4 detected power pulse.
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1 11. A method of determining a gain setting for an input amplifier generating an
2 amplified carrier signal in a receiver configured for receiving a modulated carrier
3 signal from a network medium, the method comprising:

- 4 a) generating an envelope signal from the amplified carrier signal
5 representing the amplified carrier signal power;
6 b) determining a first gain setting in response to the envelope signal, the
7 first gain setting selected for receiving a pulse position modulated carrier signal;
8 c) determining a second gain setting in response to the envelope signal,
9 the second gain setting selected for receiving a quadrature amplitude modulated
10 carrier signal;
11 d) determining whether the modulated carrier signal is a pulse position
12 modulated carrier or a quadrature amplitude modulated carrier; and
13 e) setting the gain of the input amplifier to the first gain setting if the
14 modulated carrier signal is determined to be a pulse position modulated carrier and
15 setting the input amplifier gain to the second gain setting if the modulated carrier
16 signal is determined to be a quadrature amplitude modulated carrier.
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1 12. The method of claim 11, further comprising converting the amplified carrier
2 signal to a digital carrier signal, the envelope signal being generated from the digital
3 carrier signal.
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1 13. The method of claim 12, further comprising generating an I channel signal and
2 a Q channel signal from the digital carrier signal, the envelope signal being
3 generated from the I channel signal and the Q channel signal.
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1 14. The method of claim 13, wherein the step of setting the gain of the input
2 amplifier includes detecting the duration of a power pulse in the envelope signal.
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1 15. The method of claim 14, wherein the gain of the input amplifier is set to the
2 first gain setting if the duration of a power pulse is less than a duration on the order
3 of a duration of a pulse position modulation power pulse.
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1 16. The method of claim 15, wherein the gain of the input amplifier is set to the
2 second gain setting if the duration of a power pulse is greater than a duration on the
3 order of a duration of a pulse position modulation power pulse.
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1 17. The method of claim 16, wherein the envelope signal represents the square
2 root of the sum of the square of the I channel signal and the square of the Q channel
3 signal.
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1 18. The method of claim 17, wherein the first gain setting is determined by
2 comparing the envelope signal to a plurality of reference levels and iteratively testing
3 each of the plurality of gain settings for saturation occurring at least one reference
4 level to determine the first gain setting.
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1 19. The method of claim 18, wherein the second gain setting is determined by
2 converting the envelope signal to a log signal representing the envelope signal,
3 comparing the log signal to a reference level to determine a difference, multiplying
4 the difference by a loop gain constant to determine a product, and integrating the
5 product to determined the second gain setting.
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1 20. The method of claim 19, wherein the loop gain constant is selected to be a
2 large value for a first portion of a detected power pulse, a smaller value for a second
3 portion of a detected power pulse, and zero for a remaining duration of a detected
4 power pulse.

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1 21. A network receiver configured for receiving a modulated carrier signal from
2 another network transceiver via a network medium, the network receiver comprising:

3 a) an input amplifier for amplifying a received modulated carrier signal
4 according to one of a plurality of amplifier gain settings and outputting an amplified
5 carrier signal;

6 b) a first gain control circuit for providing a first amplifier gain setting based
7 on a carrier signal modulated in accordance with a first modulation method;

8 c) a second gain control circuit for providing a second amplifier gain
9 setting based on a carrier signal modulated in accordance with a second modulation
10 method;

11 d) a selection circuit for identifying whether the carrier signal is modulated
12 in accordance with the first modulation method or the second modulation method,
13 and for providing a gain control signal to the input amplifier in accordance therewith.
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1 22. The network receiver of claim 21, wherein the selection circuit includes
2 envelop detection circuitry for detecting the duration of a power pulse in the envelope
3 signal.
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1 23. The network receiver of claim 22, wherein the selection circuit provides a gain
2 control signal coupling the first amplifier gain setting to the input amplifier if the
3 duration of a power pulse is less than a duration on the order of a duration of a pulse
4 position modulation power pulse.
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1 24. The network receiver of claim 23, wherein the selection circuit provides a gain
2 control signal coupling the second amplifier gain setting to the input amplifier if the
3 duration of a power pulse is greater than a duration on the order of a duration of a
4 pulse position modulation power pulse.
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